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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

RODRIGUEZ, WILLIAM H

ART UNIT PAPER NUMBER

3746

DATE MAILED: 05/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/065,495

Applicant(s)

BUNKER, RONALD SCOTT

Examiner

William H. Rodriguez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

FINAL REJECTION

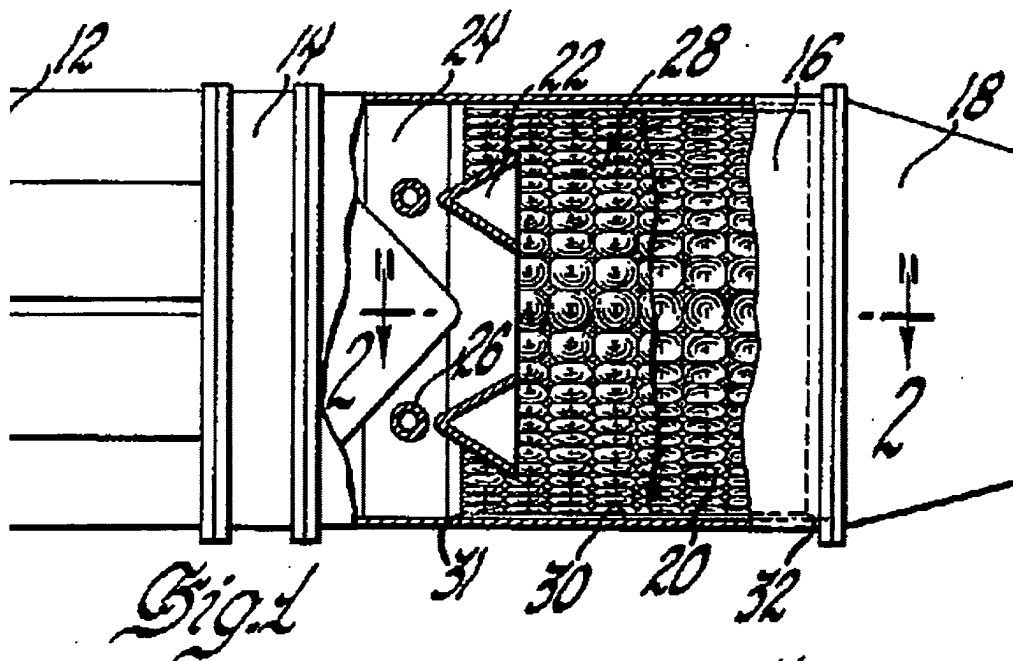
This office action is in response to the amendment and remarks filed 4/27/04.

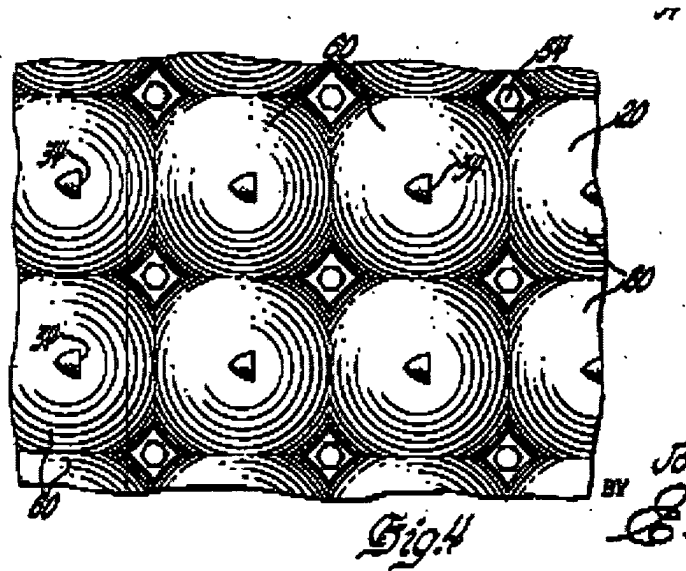
Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-8 and 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wetzler (U.S. 2,938,333) in view of Glezer et al. (U.S. 6,098,397).





With respect to claim 1, **Wetzler** teach a combustor liner 20 for a gas turbine, the combustor liner having a substantially cylindrical shape; and a plurality of axially spaced annular protrusions 60 (cup-like) formed in an outside surface of said combustor liner 20, each protrusion 60 extending continuously about a circumference of said liner. **Wetzler** does not teach a plurality of axially spaced annular grooves formed in an outside surface of said combustor liner but a plurality of annular protrusions 60. However, **Glezer et al.** teach a combustor liner 70 similar to **Wetzler**'s liner 20 having a plurality of axially spaced annular grooves 84 formed in an outside surface of said combustor liner 70. Further, **Glezer et al.** teach that said grooves 84 increase convective cooling without greatly increasing pressure losses as in the case of protruding elements. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used **Glezer**'s teachings and have provided a plurality of grooves 84 instead of protruding elements 60 to **Wetzler**'s liner so as to increase convective cooling without increasing pressure losses. See **Figures 1,4** of **Wetzler**; and **Figures 2,5** and column 5 lines 12-14 of **Glezer et al.**

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With respect to claim 2, **Wetzler** in view of **Glezer et al.** teach that said grooves 60 are substantially semi-circular in cross-section. See **Figures 1,4** of Wetzler; and **Figures 2,5** of Glezer et al.

With respect to claim 3, **Wetzler** in view of **Glezer et al.** teach that said grooves 60 are arranged transversely to a direction of cooling air flow. See **Figures 1,4** of Wetzler; and **Figures 2,5** of Glezer et al.

With respect to claims 4-6, **Wetzler** in view of **Glezer et al.** teaches that said grooves have a diameter, a depth and spacing between adjacent grooves. However, these dimensions do not fall between the ranges claimed in the instant application. Nevertheless, selecting a different diameter, depth and spacing between adjacent grooves is a design choice within the level of one of ordinary skill in the art. This selection could have been based on design constraints such as but no limited to: combustor weight (removal of more material, a lighter combustor), quantity of turbulence required to enhance or increase cooling, etc. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected different dimensions for the diameter, depth and spacing of **Wetzler-Glezer's** grooves in order to satisfy certain specific design constraints. See particularly column 4 line 45 to column 5 line 14 of Glezer et al.

Note: In practice, the materials used, as well as the shapes and dimensions, can be varied at will according to technical requirements.

With respect to claim 7, **Wetzler** in view of **Glezer et al.** teach that said grooves 60 are each comprised of overlapping circular concavities. See particularly **Figure 4** of Wetzler.

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With respect to claim 8, **Wetzler** in view of **Glezer et al.** teach that said grooves are 84 angled relative to a direction of cooling air. See **Figures 1,4** of **Wetzler**; and **Figures 2,5** of **Glezer et al.**

With respect to claim 10, **Wetzler** teach a combustor liner 20 for a gas turbine, the combustor liner having a substantially cylindrical shape; and a plurality of axially spaced annular protrusions 60 (cup-like) formed in an outside surface of said combustor liner 20, each protrusion 60 extending continuously about a circumference of said liner, wherein said protrusions are semi-circular in cross-section, and have a diameter D. **Wetzler** does not teach a plurality of axially spaced annular grooves formed in an outside surface of said combustor liner, wherein the depth of said grooves is equal to about 0.05 to 0.50D. However, **Glezer et al.** teach a combustor liner 70 similar to **Wetzler**'s liner 20 having a plurality of axially spaced annular grooves 84 formed in an outside surface of said combustor liner 70. Further, **Glezer et al.** teach that said grooves 84 increase convective cooling without greatly increasing pressure losses as in the case of protruding elements. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used **Glezer**'s teachings and have provided a plurality of grooves 84 instead of protruding elements 60 to **Wetzler**'s liner so as to increase convective cooling without increasing pressure losses. Further, selecting a depth of said grooves 84 is a design choice within the level of one of ordinary skill in the art. This selection could have been based on design constraints or technical requirements such as but not limited to: combustor weight (removal of more material, a lighter combustor), quantity of turbulence required to enhance or increase cooling, etc. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected an appropriate depth

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for the **Wetzler-Glezer's** grooves in order to satisfy certain specific design constraints. See **Figures 1,4** of Wetzler; and **Figures 2,5** and column 5 lines 12-14 of Glezer et al.

Note: In practice, the materials used, as well as the shapes and dimensions, can be varied at will according to technical requirements.

With respect to claims 11 and 13, **Wetzler** in view of **Glezer et al.** teaches that said grooves have a diameter, a depth and spacing between adjacent grooves. However, these dimensions do not fall between the ranges claimed in the instant application. Nevertheless, selecting a different diameter, depth and spacing between adjacent grooves is a design choice within the level of one of ordinary skill in the art. This selection could have been based on design constraints such as but no limited to: combustor weight (removal of more material, a lighter combustor), quantity of turbulence required to enhance or increase cooling, etc. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected different dimensions for the diameter, depth and spacing of **Wetzler-Glezer's** grooves in order to satisfy certain specific design constraints. See particularly column 4 line 45 to column 5 line 14 of Glezer et al.

Note: In practice, the materials used, as well as the shapes and dimensions, can be varied at will according to technical requirements.

With respect to claim 12, **Wetzler** in view of **Glezer et al.** teach that said grooves 60 are substantially semi-circular in cross-section. See **Figures 1,4** of Wetzler; and **Figures 2,5** of Glezer et al.

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With respect to claim 14, **Wetzler** in view of **Glezer et al.** teach that said grooves 60 are arranged transversely to a direction of cooling air flow. See **Figures 1,4** of Wetzler; and **Figures 2,5** of Glezer et al.

With respect to claim 15, **Wetzler** in view of **Glezer et al.** teach that said grooves are 84 angled relative to a direction of cooling air. See **Figures 1,4** of Wetzler; and **Figures 2,5** of Glezer et al.

Claim Rejections - 35 USC § 102

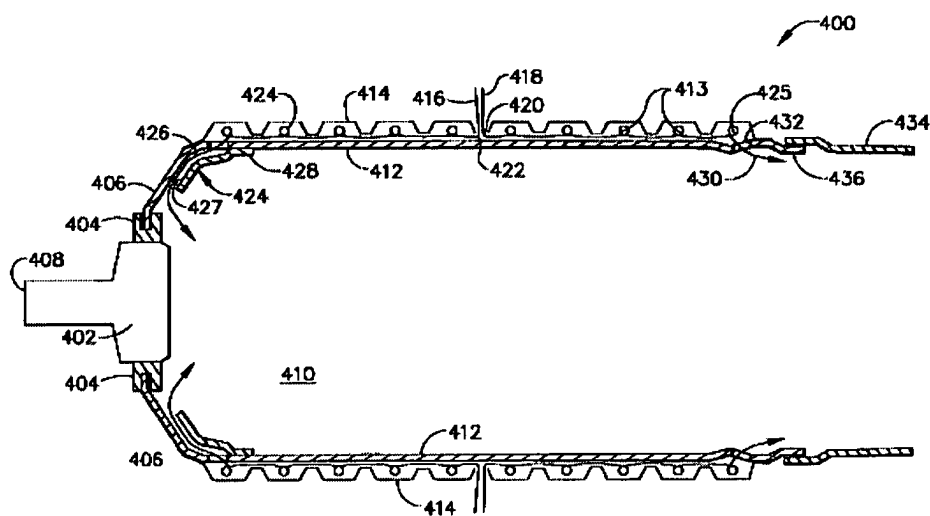
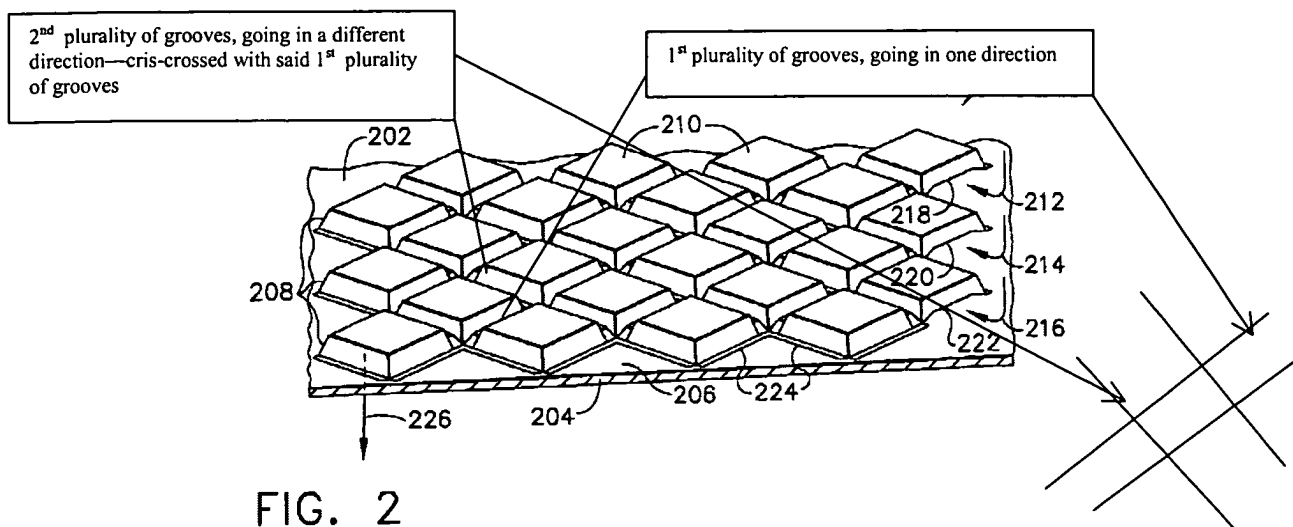
3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim 9 is rejected under 35 U.S.C. 102(e) as being anticipated by **Hadder (U.S. 6,530,225)**.

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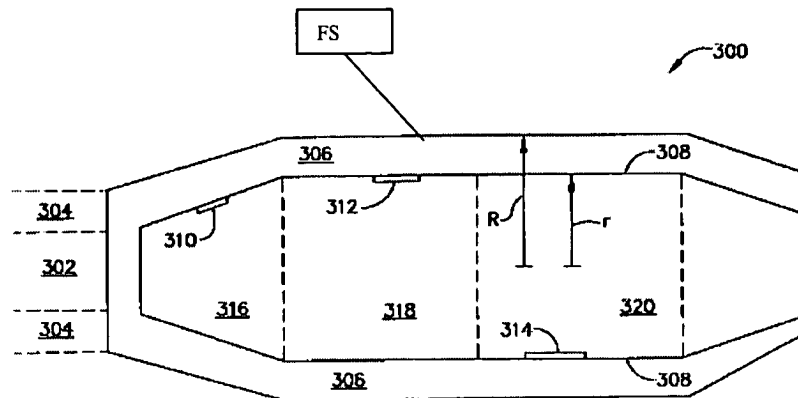


FIG. 3

Hadder teaches a combustor comprising a liner for a gas turbine, the combustor liner having a substantially cylindrical shape; a flow sleeve FS surrounding said liner; a first plurality of axially spaced circumferential grooves (space between protrusions) formed in an outside surface of said combustor liner, angled relative to a direction of cooling air flowing between said liner and said flow sleeve; and a second plurality of circumferential grooves criss-crossed with said first plurality of axially spaced circumferential grooves. See particularly **Figures 2, 3, 4**; column 5 line 55 to column 6 line 12 of Hadder.

Response to Arguments

5. Applicant's arguments with respect to claims 1-15 filed 4/27/04 have been fully considered but they are not persuasive because of the following reasons.

With respect to claims 1-8 and 10-15, on pages 8 last full paragraph to page 9 second full paragraph applicant argues that *Glezer clearly fails to disclose or suggest the plurality of annular grooves extending continuously about a circumference of the liner*. While it is true that Glezer fails to disclose or suggest a plurality of annular grooves extending continuously about a circumference of the liner, Wetzler (the base reference for the rejection) does teach a plurality of

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annular protrusions extending continuously about a circumference of the liner. For this reason, examiner used Wetzler as the base reference for the teachings of a plurality of annular protrusions extending continuously about a circumference of the liner and the reference to Glezer for the teachings of replacing Wetzler protrusions by grooves. Therefore, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

With respect claim 9, page 7 last two lines to page 8 first 3 lines applicant argues that the outer element 414 in *Hadder* is not a combustion liner located concentrically within an outer flow sleeve such that grooves are open to the flow sleeve and air flow flows between the liner and the flow sleeve across the grooves. Examiner disagrees because *Hadder* does teach a combustion liner located concentrically within an outer flow sleeve FL such that grooves are open to the flow sleeve and airflow (304) flows between the liner and the flow sleeve across the grooves. See particularly **Figure 3**, column 5 line 55 to column 6 line 12 of *Hadder*.

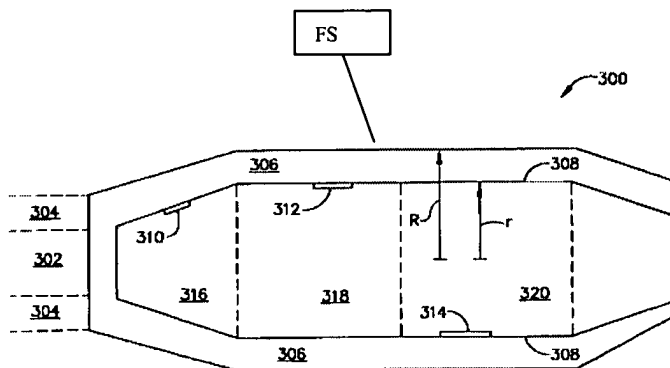


FIG. 3

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Contact information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William H. Rodriguez whose telephone number is 703-605-1140. The examiner can normally be reached on Monday-Friday 7:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Justine R Yu can be reached on 703-308-2675. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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5/22/04